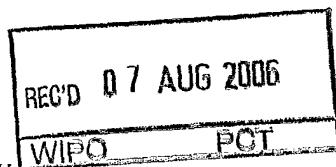


**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference JWC-12010/WO	FOR FURTHER ACTION		See From PCT/IPEA/416
International application No. <b>PCT/CA2005/000462</b>	International filing date (day/month/year) 30 March 2005 (30-03-2005)	Priority date (day/month/year) 31 March 2004 (31-03-2004)	
International Patent Classification (IPC) or national classification and IPC IPC: <b>F02B 23/00</b> (2006.01), <b>F02B 33/10</b> (2006.01), <b>F02B 53/04</b> (2006.01)			
Applicant <b>MAJOR, JEAN-LOUIS</b>			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <u>3</u> sheets, as follows:</p> <p style="margin-left: 20px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. 1 and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 25 October 2005 (25-10-2005)	Date of completion of this report 3 August 2006 (03-08-2006)		
Name and mailing address of the IPEA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	Authorized officer <b>Felix-Antoine Dandenault (819) 934-3415</b>		

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/CA2005/000462

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on:

- the international application in the language in which it was filed  
 a translation of the international application into  
 translation furnished for the purposes of:  
 international search (Rules 12.3(a) and 23.1(b))  
 publication of the international application (Rule 12.4(a))  
 international preliminary examination (Rules 55.2(a) and/or 55.3(a))

, which is the language of a

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- the international application as originally filed/furnished  
 the description:

pages 1 to 17, 21 and 22  
 pages\*  
 pages\*

received by this Authority on  
 received by this Authority on

as originally filed/furnished

- the claims:

pages  
 pages\*  
 pages\* *18 to 20*  
 pages\*

as originally filed/furnished  
 as amended (together with any statement) under Article 19  
 received by this Authority on 27 July 2006  
 received by this Authority on

- the drawings:

pages 1/8 to 8/8  
 pages\*  
 pages\*

received by this Authority on  
 received by this Authority on

as originally filed/furnished

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

- the description, pages  
 the claims, Nos. 10  
 the drawings, sheets/figs  
 the sequence listing (*specify*):  
 any table(s) related to sequence listing (*specify*):

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages  
 the claims, Nos.  
 the drawings, sheets/figs  
 the sequence listing (*specify*):  
 any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/CA2005/000462

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1 to 9</u>	YES
	Claims	<u>NONE</u>	
Inventive step (IS)	Claims	<u>1 to 9</u>	YES
	Claims	<u>NONE</u>	
Industrial applicability (IA)	Claims	<u>1 to 9</u>	YES
	Claims	<u>NONE</u>	

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

- D1: US 2 339 848 (FEENEY) 25 January 1944 (25-01-1944)  
 D2: US 4 627 389 (SIMON) 9 December 1986 (09-12-1986)  
 D3: GB 2 384 525 A (STOTT) 30 July 2003 (30-07-2003)

Novelty:

Explanation provided with respect to Article 33 (2):

Claims 1 to 9 meet the novelty criteria as defined in PCT Article 33 (2).

Inventive step:

Explanation provided with respect to Article 33 (3):

D1 is considered to be the most relevant prior art document with respect to claim 1. D1 discloses a double action piston assembly including a combustion chamber (13) having a first end and a second end and containing a double action piston (19) connected to a power rod (45). The combustion chamber comprises a first intake port (59) and a first exhaust port (upper part of 7), a second intake port (57) and a second exhaust port (lower part of 7), valve assemblies (61 and 63) for opening and closing the intake ports (57 and 59) and the piston assembly (19) for opening and closing the exhaust ports. D1 also discloses a compression chamber (15) in alignment with the combustion chamber. The power rod passes through the lower wall of the combustion chamber into the compression chamber and out the lower end of the compression chamber to a connecting rod (35) and a crankshaft (33). The compression chamber further comprises a second piston (51), a first compression intake valve (column 6, lines 35) and a second compression intake valve (column 6, line 35) and conduit means linking the compression chamber to the combustion chamber (57 and 58). The combustion chamber further comprises means to inject fuel (83, embodiment of fig. 5) and ignition means (47 and 49) in both ends of the combustion chamber. Scavenging of the combustion chamber is achieved at each time the pistons reach an end of the chamber (top and bottom dead centres).

[X]See Supplemental Box

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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**Box No. VII      Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

The application contains two pages numbered 17, the first page of the claims and the last page of the description. The claim pages should be renumbered 18, 19 and 20.

The abstract does not comply with Rule 8.1(b) and Rule 8.1(d) of the PCT. The abstract should be concise and each main technical feature mentioned in the abstract and illustrated by a drawing in the international application should be followed by a reference sign, placed between parentheses.

The following abstract would be acceptable:

A double action piston assembly for an internal combustion engine. The assembly comprises a combustion chamber (11) in axial alignment with a compression chamber (29) and in perpendicular alignment with a crankshaft (31). A connecting rod (44) has a first end connected to the crankshaft and a second end connected to a central power rod (8) itself connecting the compression piston (27) and the combustion piston (6). The central power rod traverse the compression and combustion chamber in their longitudinal axis. The combustion and compression chambers further include upper and lower inlet and outlet ports (12, 14, 34, 37, 13, 15, 35 and 38). The upper outlet port of the compression chamber is connected to the lower intake port of the combustion chamber and vice-versa. The upper and lower inlet ports of the compression chamber comprise means to introduce water (40, 41) into the compression chamber.

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of:      Box V

Claim 1 of the present application distinguish itself from the disclosure of D1 in that it further includes:

A- a one piece power rod (8);

B- means to introduce water vapour (40, 41) in the compression chamber through the compression chamber intake valves;

C- a valve system further including valves positioned at the exhausts of the combustion chamber and at the exhaust of the compression chamber (the valves (61 and 63) of D1 being at the intake of the combustion chamber).

With regard to the distinguishing feature of a one piece power rod (A), it is clearly a design choice as it would be within the scope of the technical person skilled in the art to change the constructional design of the power rod without involving inventiveness or creating an unforeseen result.

With regard to the distinguishing feature of the means to introduce water vapour in the compression chamber through the compression intake valves (B), it is known in the art of diesel engine as disclosed in D3 to introduce water vapour into the intake air manifold upstream of the intercooler (page 2, last paragraph (5.3.2)). The disclosure of D3 is directed to a turbocharged diesel engine including a turbo compressor, a device similar in its effect on the intake pressure of the engine as the compression chamber of the present application. Thus the means to introduce water vapour in the compression chamber would be obvious in view of the disclosure of D3.

However, none of D1 or D3 alone or in combination discloses an internal combustion engine having the valves system disclosed in claim 1 (C) and thus the combination of the disclosure of D1 and D3 is not sufficient to cover all the features of claim 1.

Independent claim 1 and dependent claims 2 to 9 meet the inventive step criteria as defined in PCT Article 33 (3).

**Industrial Applicability:**

With regard to PCT Article 33 (4), claims 1 to 9 meet the industrial applicability criteria as defined in PCT Article 33 (4).